4-28-1969

Test 1008: Massey-Ferguson MF 165 Gasoline (Also MF 30 IND and MF 165 8-Speed Gasoline)

Tractor Museum
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NEBRASKA TRACTOR TEST 1008 – MASSEY-FERGUSON MF 165 GASOLINE
(ALSO MASSEY-FERGUSON MF 30 IND GASOLINE)
(ALSO MF 165 8-SPEED GASOLINE)

POWER TAKE-OFF PERFORMANCE

Hp	Crankshaft speed rpm	Fuel Consumption: Gal per hr	Fuel Consumption: Lb per hp-hr	Fuel Consumption: Hp-hr per gal	Temperature Degrees F: Cooling medium	Temperature Degrees F: Air wet bulb	Temperature Degrees F: Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours								
51.91	2000	4.783	0.559	10.85	188	66	75	28.805
Standard Power Take-off Speed (540 rpm)—One Hour								
48.20	1683	4.358	0.549	11.06	191	67	75	28.810
VARYING POWER AND FUEL CONSUMPTION—TWO HOURS								
47.17	2140	4.788	0.616	9.85	189	68	77	.....
0.00	2269	2.159	.....	.....	180	66	76	.....
20.92	2206	3.622	1.051	5.78	184	67	76	.....
51.83	2001	4.773	0.559	10.86	190	67	77	.....
12.34	2237	2.925	1.439	4.22	182	68	79	.....
35.79	2164	4.308	0.731	8.31	188	68	79	.....
Av 28.01	**2169**	**3.762**	**0.816**	**7.45**	**186**	**67**	**77**	**28.781**

DRAWBAR PERFORMANCE

Hp	Drawbar pull lbs	Speed miles per hr	Crankshaft speed rpm	Slip of drivers %	Fuel Consumption: Gal per hr	Fuel Consumption: Lb per hp-hr	Fuel Consumption: Hp-hr per gal	Temp Degrees F: Cooling med	Temp Degrees F: Air wet bulb	Temp Degrees F: Air dry bulb	Barometer inches of Mercury
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours—7th Gear											
44.44	3173	5.25	1999	6.04	4.850	0.663	9.16	183	49	54	28.988
75% of Pull at Maximum Power—Ten Hours—7th Gear											
37.99	2479	5.75	2153	4.52	4.601	0.735	8.26	186	50	62	28.872
50% of Pull at Maximum Power—Two Hours—7th Gear											
25.95	1654	5.88	2176	3.24	4.026	0.942	6.45	184	50	63	28.930
MAXIMUM POWER WITH BALLAST											
39.18	6005	2.45	2084	14.55	4th Gear			190	65	75	28.680
43.69	4680	3.50	2001	8.94	5th Gear			187	49	55	28.990
44.54	3547	4.71	2002	6.47	6th Gear			187	50	58	28.990
45.77	3262	5.26	2001	5.98	7th Gear			188	51	59	28.990
44.26	2375	6.99	2000	4.36	8th Gear			187	53	62	28.990
44.76	2090	8.03	1997	3.98	9th Gear			187	51	60	28.990
42.88	1510	10.65	2002	2.95	10th Gear			186	51	61	28.990
MAXIMUM PULL WITHOUT BALLAST											
33.80	5033	2.52	2146	14.90	4th Gear			190	54	71	28.810

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST—7th Gear						
Pounds pull	3262	3480	3676	3875	3959	3907
Horsepower	45.77	43.72	40.86	37.61	32.94	27.15
Crankshaft speed rpm	2001	1800	1599	1403	1205	1004
Miles per hour	5.26	4.71	4.17	3.64	3.12	2.61
Slip of drivers, %	5.98	6.35	6.83	7.31	7.31	7.19

TIRES, BALLAST and WEIGHT		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 16.9-28; 6; 16	Two 16.9-28; 6; 16
Ballast	—Liquid	831 lb each	None
	Cast iron	97 lb each	None
Front tires	—No, size, ply & psi	Two 6.50-16; 6; 24	Two 6.50-16; 6; 24
Ballast	—Liquid	None	None
	Cast iron	38 lb each	None
Height of drawbar		20½ inches	21 inches
Static weight with operator—Rear		5870 lb	4015 lb
	Front	1890 lb	1815 lb
	Total	7760 lb	5830 lb

Department of Agricultural Engineering
Date of Test: April 28 to May 12, 1969
Manufacturer: MASSEY-FERGUSON INC., DETROIT, MICHIGAN

FUEL, OIL and TIME Fuel Regular gasoline **Octane No** Motor 85.2 Research 92.6 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.7294 **Weight per gallon** 6.072 lb **Oil** SAE 20-20W **API service classification** MS, DM **To motor** 1.981 gal **Drained from motor** 1.665 gal **Transmission and final-drive lubricant** Massey-Ferguson oil M-1129A **Total time engine was operated** 59 hours.

ENGINE Make Perkins gasoline **Type** 4 cylinder vertical **Serial No** 212UA 405A **Crankshaft mounted** lengthwise **Rated rpm** 2000 **Bore and stroke** 3⅞" x 4½" **Compression ratio** 7.0 to 1 **Displacement** 212 cu in **Carburetor size** $1^{5}/_{16}$" **Ignition system** battery **Cranking system** 12 volt electric **Lubrication** pressure **Air cleaner** Dry type replaceable pleated paper element **Oil filter** full flow replaceable paper element **Oil cooler** Radiator for transmission **Fuel filter** sediment bowl and screen **Muffler** was used **Cooling medium temperature control** thermostat.

CHASSIS Type Standard **Serial No** 9A67123 **Tread width** rear 56" to 90" front 48½" to 80½" **Wheel base** 82" **Center of gravity** (without operator or ballast with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from centerline of rear wheels 30" Vertical distance above roadway 30.3" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** Constant running except when PTO foot clutch is disengaged **Transmission** selective gear fixed ratio with partial range operator controlled power shift **Advertised speeds mph** first 1.36 second 1.79 third 2.05 fourth 2.68 fifth 3.76 sixth 4.91 seventh 5.45 eighth 7.14 ninth 8.18 tenth 10.71 eleventh 15.00 twelfth 19.65 reverse 1.86, 2.43, 7.43, 9.72 **Clutch** single plate dry disc with PTO clutch operated by single foot pedal combination **Brakes** double disc operated by two foot pedals which can be locked together **Steering** Mechanical with power assist **Turning radius** (on concrete surface with brake applied) right 126" left 126" (on concrete surface without brake) right 140" left 144" **Turning space diameter** (on concrete surface with brake applied) right 264" left 264" (on concrete surface without brake) right 290" left 300" **Belt pulley** 1176 rpm at 1975 engine rpm diam 10¼" face 16½" **Belt speed** 3117 fpm **Power take-off** 540 rpm at 1700 engine rpm.

REPAIRS and ADJUSTMENTS: During preliminary PTO runs the fixed carburetor jet was replaced with an adjustable jet. During the ten hour run the hydraulic power assist for steering became inoperative. An adjustment on control valve corrected this and test continued.

REMARKS: All test results were determined from observed data obtained in accordance with the SAE and ASAE test code. First, second and third gears were not run as it was necessary to limit the pull in fourth gear because of the stability formula. Eleventh and twelfth gears were not run as both exceeded 15 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test 1008.

L. F. LARSEN
Engineer-In-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
D. E. LANE
Board of Tractor Test Engineers

The University of Nebraska Agricultural Experiment Station
E. F. Frolik, Dean; H. W. Ottoson, Director; Lincoln, Nebraska

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories can be disconnected only when it is convenient for the operator to do so in practice. Additional weight can be added as ballast if the manufacturer regularly supplies it for sale. The static tire loads and the inflation pressures must conform to recommendations in the Tire Standards published by the Society of Automotive Engineers.

PREPARATION FOR PERFORMANCE RUNS

The engine crankcase is drained and refilled with a measured amount of new oil conforming to specifications in the operators manual. The fuel used and the maintenance operations must also conform to the published information delivered with the tractor. The tractor is then limbered-up for 12 hours on drawbar work in accordance with the manufacturer's published recommendations. The manufacturer's representative is present to make appropriate decisions regarding mechanical adjustments.

The tractor is equipped with approximately the amount of added ballast that is used during maximum drawbar tests. The tire tread-bar height must be at least 65% of new tread height prior to the maximum power run.

BELT OR POWER TAKE-OFF PERFORMANCE

Maximum Power and Fuel Consumption. The manufacturer's representative makes carburetor, fuel pump, ignition and governor control settings which remain unchanged throughout all subsequent runs. The governor and the manually operated governor control lever is set to provide the high-idle speed specified by the manufacturer for maximum power. Maximum power is measured by connecting the belt pulley or the power take-off to a dynamometer. The dynamometer load is then gradually increased until the engine is operating at the rated speed specified by the manufacturer for maximum power. The corresponding fuel consumption is measured.

Varying Power and Fuel Consumption. Six different horsepower levels are used to show corresponding fuel consumption rates and how the governor causes the engine to react to the following changes in dynamometer load: 85% of the dynamometer torque at maximum power; minimum dynamometer torque, ½ of the 85% torque; maximum power, ¼ and ¾ of the 85% torque. Since a tractor is generally subjected to varying loads the average of the results in this test serve well for predicting the fuel consumption of a tractor in general usage.

DRAWBAR PERFORMANCE

All engine adjustments are the same as those used in the belt or power take-off tests. If the manufacturer specifies a different rated crankshaft speed for drawbar operations, then the position of the manually operated governor control is changed to provide the high-idle speed specified by the manufacturer in the operating instructions.

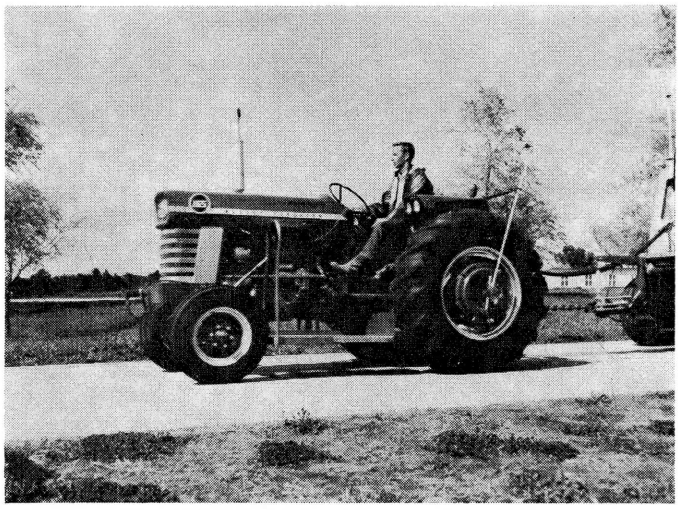
Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effect of speed-control devices (engine, governor, automatic transmission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to the pull at maximum power as possible and still have the tractor maintain the travel speed at maximum horsepower on the straight sections of the test course; (2) 75% of the pull at maximum power; and (3) 50% of the pull at maximum power. Prior to 1958, fuel consumption data (10 hour test) were shown only for the pull obtained at maximum power for tractors having torque converters and at 75% of the pull obtained at maximum power for gear-type tractors.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 12 different gears or travel speeds. Some gears or travel speeds may be omitted because of high slippage of the traction members or because the travel speed may exceed the safe-limit for the test course. The maximum safe speed for the Nebraska Test Course has been set at 15 miles per hour. The slippage limits have been set at 15% and 7% for pneumatic tires and steel tracks or lugs, respectively. Higher slippage gives widely varying results.

Maximum Pull without Ballast. All added ballast is removed from the tractor. The drawbar pull is determined at slip limits of 15% for pneumatic tires or 7% for steel tracks or lugs. The tractor is operated at the fastest possible travel speed.

Varying Power and Travel Speed with Ballast. Travel speeds corresponding to drawbar pulls beyond the maximum power range are obtained to show the "lugging ability" of the tractor. The run starts with the pull at maximum power; then additional drawbar pull is applied to cause decreasing speeds. The run is ended by one of three conditions: (1) maximum pull is obtained, (2) the maximum slippage limit is reached, or (3) some other operating limit is reached.

For additional information about the **Nebraska Tractor Tests** write to the **Department of Agricultural Engineering, University of Nebraska, Lincoln, Nebraska.**



MASSEY-FERGUSON MF 165 GASOLINE